

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 28 JUL 2005

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To:

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing

(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/US2005/001999

International filing date (day/month/year)
21.01.2005

Priority date (day/month/year)
21.01.2004

International Patent Classification (IPC) or both national classification and IPC
H05K3/34, H01L23/495, H01R13/03, C25D5/12

Applicant
ENTHONE INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2005/001999

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2005/001999

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	15,23
	No: Claims	1-14,16-22,24-27
Inventive step (IS)	Yes: Claims	
	No: Claims	15,23
Industrial applicability (IA)	Yes: Claims	1-27
	No: Claims	

2. Citations and explanations

see separate sheet

SECTION V

1. Reference is made to the following documents:

D1: US 2003/025182 A1 (ABYS JOSEPH A ET AL) 6 February 2003 (2003-02-06)
D2: US 2002/187364 A1 (HEBER JOCHEN ET AL) 12 December 2002 (2002-12-12)
D3: US-B1-6 613 451 (ASAHARA HAJIME ET AL) 2 September 2003 (2003-09-02)

2. D1 discloses (see whole document) a method comprising all of the features of claim 1: first metal layer 12; metal surface 10; tin-based coating 13 having a thickness greater than 0.5 microns (see par. [0022], where the tensile stress is also mentioned).

The additional features of claims 2,3,4,5,6,7,8,9,10,16-20,25 are known directly from D1.

3. D2 discloses (see paragraphs [0009] - [0023]) a method comprising all of the features of claim 1: first metal layer (underlayer) ; metal surface (substrate); tin-based coating having a thickness greater than 0.5 microns.

The additional features of claims 2,3,4,5,6,7,8,9,10,11,12,16-20,25 are known directly from D2.

4. D3 discloses (see Col.2, l.35 - Col.6, l. 64) a method comprising all of the features of claim 1: first metal layer ("intermediate layer") ; metal surface ("base metal"); tin-based coating having a thickness greater than 0.5 microns (see Col.6, l.48-49).

The additional features of claims 2,3,4,5,6,7,8,9,10,12,13,14,16-20,21,22,24,25,26,27 are known directly from D3.

5. Claims 15,23

The skilled person following the teaching of D3 would provide the claimed solution without the requirement of an inventive step, because in order to provide a layer of

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AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/US2005/001999

nickel with 0.05% - 20% P content, it would be necessary to provide an electrodeposition bath having an amount of p-based additive of the order claimed.

Further Observations:

1. The presence of a plurality of independent claims in the same category means that the claims as a whole are not concise. In the present case a single independent claim in any category is appropriate.
2. The claims are inconsistent. The specified thickness of the tin layer is different in the different independent claims. Hence the claims are inconsistent.